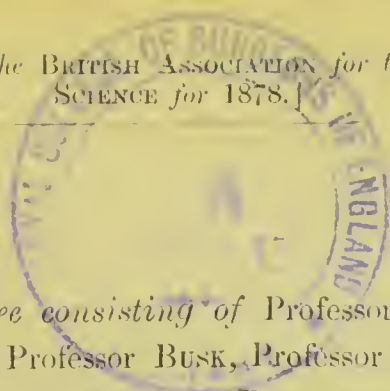


12.





Report of a Committee consisting of Professor ROLLESTON, Major-General LANE FOX, Professor BUSK, Professor BOYD DAWKINS, Dr. JOHN EVANS, and Mr. F. G. HILTON PRICE, appointed for the purpose of examining Two Caves containing human remains, in the neighbourhood of Tenby.

OPERATIONS were commenced in the way of the exploration of the "Little Hoyle" Cave, Longbury Bank, parish of Penally, near Tenby, on Monday, July 22, 1878, and were continued during that week and upon the ensuing Monday.

It will be well to begin our report by a summary of the results which we have attained, and in the second place to give in detail the facts upon which our general conclusions have been based.

The two caves which we here examined are contained in a peninsula of mountain-limestone known as "Longbury Bank," bounded on either side by a valley which unites with its fellow at the bluffly-ending N.E. extremity of the "bank." If we compare the levels hereinafter given with the facts spoken to by the raised beaches along this coast, and by other observations we cannot doubt that Longbury Bank was once, and that in no very remote geological period, washed on either side by the sea, and presented much the same general appearance as some of the still so called "beach" banks in the neighbourhood of Pembroke. Of the two caves examined by us, one contained no objects of special interest, and the other had been previously investigated by other explorers, viz., the Rev. H. H. Wood, of Bath (see 'Cave Hunting,' by Professor Boyd Dawkins, F.R.S. p. 133, and 'British Mammalia,' Memoirs Paleont. Society, 1878, p. 10), and Mr. Edward Laws, of Tenby (see 'Journal of Anthropological Institute,' August 1877). A very considerable segment, however, of this latter cave had been left unexamined, and it has been by the examination of this undisturbed portion of the cave, and by the clearing out and investigation of the contents of all the rest of the cave, and comparison of them with the specimens previously obtained and most liberally put at our disposal for this purpose by Mr. Edward Laws, that we have been able to come to the following results.

The cave in question, known in the neighbourhood as "Little Hoyle," in contradistinction to a much larger cavern close by, known as "Hoyle's Mouth," may be divided roughly into two main segments, one beginning with a large mouth opening northwards, and extending from that mouth in a direction S. and with a sharp slope upwards up to a point distant 25 feet from the mouth. The other of about 16 feet in length, dipping downwards from that point in a S.E. direction, to communicate by a narrow hole with a wide cave mouth on the S.E. side of the bank in which bones of man, bear, and ox had been previously found by Mr. Laws. This second segment of the cave had underlaid one of those "initiator areas of depression," to use the phraseology of the late Professor Phillips (see 'Report of British Association,' Bath Meeting, 1864, p. 63-64), which

ultimately lead, and here had led, to the breaking-in of the eave's roof, and which might here be spoken of in the phraseology of the county as a "sink" or "soaker." It was filled up to a depth of nearly 10 feet with fragments of limestone, and made earth containing bones of men, domestic animals, foxes, rabbits, and oyster and limpet shells. We may speak of it hereafter as the "segment of depression."

This "segment of depression" had been scarcely touched by any explorers previously to ourselves. The longer segment of the eave, opening northwards, may be spoken of as the "north cave;" and a comparatively low diverticulum 16 feet long, branching off from it to the east, and widening from 3 feet to 10 feet for about 9 feet of its length, we may speak of as the "east chamber." This last we found by means of smoke to communicate through a narrow flue, with a small flat surface near the top of bank, which was potentially an "area of depression," but had actually been a fox-earth. Having in mind the levels and communications of the several parts of this cave, and considering in connection with them the relative proportions and conditions in which the contents of the eave, viz., (1) breccia and stalagmite, (2) red eave-earth, (3) black earth mixed with angular stones, (4) worked flint and other implements, (5) fragments of pottery, (6) ashes, and (7) bones of men and of beasts, pleistocene and other, found in the different segments of the eave, we are, on the whole, of opinion that though the main or north portion of the eave was used by man for purposes of habitation in times at least as early as those in which the brown bear (*Ursus Arctos*) was still living in this country, the part of the eave in which the greater part of human remains were found, viz., the "segment of depression," has come to contain those remains simply by the falling in of its roof, and of a burial-place which had existed over it whilst it was yet only an "initiatory area of depression." We are further of opinion that at no geologically recent time previous to that of our clearing out of the eave can any very free intercommunication have existed between these two portions of it, at least at times when they were above the level of the sea; for the traces, at least those which are unmistakeable and unambiguous, of its habitation at one time by man and at another by pleistocene animals, are confined to its northern portion, which it is difficult to think they would have been if its two portions had been in open communication with each other; though the north eave is intrinsically as at present, and must have been always, better suited for the purpose in question. We have not found any evidence in this eave of man's having been a contemporary of the extinct pleistocene animals. The remains indeed of these animals themselves consist mainly of comparatively small fragments, and are representative merely of much larger quantities which were washed out of it by the sea in some later occupancies of its interior, or may have been otherwise removed.

There can be little doubt that, though man used the "north eave" for purposes of habitation, the area above the south part of it was not used except for purposes of interment. Otherwise, more relics of the articles for daily use in life would have been found in that segment. But we have no evidence to show that the first use of the "north eave" for habitation may not have been even long anterior in date to the first use of the other area for interment.

Nearly all the human bones, whether of the skull, limbs, or trunk, which were found by us in this eave, came from the previously undisturbed space in the "segment of depression;" some few, however, were found

externally to the north entrance of the cave, and must, *ex hypothesi* above stated, have been passed down the whole length of the slope constituted by the "north cave." Nearly all, again, of the human skull-bones found by Mr. Edward Laws ('Journal Anth. Institute,' Aug. 1877) were lying close together, near the southern extremity of the north cave, where its upward sloping floor reaches its summit and becomes continuous with that of the "segment of depression." In other words, nearly all the human bones found in this cave were in positions into which they might, as the sections show, have been thrown or rolled if they had been lying on the roof of the "segment of depression" when that roof fell in, and, as the depth from the present natural surface round the "segment of depression" down to the red cave-earth at the bottom of it may be taken as being from 12 to 14 feet, we have here a fall sufficient to account at once for the fragmentary condition of the human and other bones found in this space, and for the space over and within which they were distributed or dispersed. *Ex hypothesi*, these bones would be showered down upon a watershed-like line of demarcation between the "north cave" and the "segment of depression," and scattered in either direction much as is the sand in an inverted hour-glass. In some cases a few bones such as the upper cervical vertebræ and some of the cranial bones would retain their natural relations of apposition, especially at the circumference under the cave walls; in others they would be widely separated; and the long bones would in almost every case be broken into longer or shorter segments. This was actually the state of the case; a state not explicable on the hypothesis of their having been introduced, as bones must so often be held to have been, by water-carriage, to say nothing of the impossibility of the feeding-ground, represented by the upper surface of the bank having been large enough to furnish sufficient water for such flotation.

We are not aware that this explanation of the presence of human bones mixed with those of domesticated animals in a cave by the gradual or sudden descent into it of such bones from a superimposed interment is necessitated by the phenomena of any other cave; it is obvious enough, however, that the concave surface presented by an "initiator area of depression" would be very likely to suggest itself as a convenient site for such a purpose to any race of men who might be sufficiently free at once from the conventionalities of civilised life, and from the superstitions of savage life, and might be glad to take an easy way of burying their dead out of their sight. It must also be plain that no mode of burial, whether practised by civilised or by savage men, would by itself account for the scattering through so many (12-13) feet in depth of so many human bones, of so many (9-11) individuals, and this in the absence of any undisturbed burial of an entire skeleton or of a burnt body.

If the hypothesis of a number of interments having been let down into the "depression segment" will account for the presence of human bones in that portion of the Longbury Bank Cave, the great abundance of certain domesticated animals, viz., of the goat and cow, and the presence of the pig and horse, as also of edible shell-fish—limpets, oysters, and winkles—in smaller quantities, in the northern or larger portion of the cave, as also the discovery in it and upon its natural floor of the ashes of a fire-place, must be taken to prove that the main portion of the cave was used as a human habitation. Some little weight, but not very much, may also be given to the fact that of the few fragments of pottery and bone implements found inside the cave, all were found either in this part

of the cave or on the surface elsewhere; and that of the worked stone implements, all but the single specimen found in the "depression segment" came also from the north cave. It would have been strange if this cave had not been employed for purposes of habitation by some one or more of the tribes of the neighbourhood, who must have become acquainted with it in some one or more of the periods in which it was, owing to one of the upheavals which have taken place along this coast, left as comparatively dry and commodious as it is at present. The easily available upward sloping entrance, admitting of refuse being got rid of without much trouble, and the height of the roof of this portion of the cave as well as the very considerable "floor space" free from stalagmitic drip which it must always since the glacial period have possessed in æras of upheaval, put this portion of the cave at great advantage for dwelling purposes as compared with the "segment of depression." And this advantage appears to have made itself evident to the pleistocene lower animals, as well as to neolithic and later man. For though some not inconsiderable amount of pleistocene remains, notably bones gnawed by hyænas, fragments of teeth of rhinoceros, and large if not always identifiable fragments from the large bones of that or other animals of similar bulk, were found in the north cave; these animals were not represented elsewhere in the cave. Further, it is highly probable that the north cave and the segment of depression may at all previous periods have been connected by but a small passage, the fragments from the roof broken off by the glacial cold or by the shocks of earthquakes having been accumulated in a great mass on the water-shed-like line of demarcation between them, and so having rendered access from the one to the other difficult. The opening of the north cave into the segment of depression is, from the top of the arch of the cave down to the natural bottom, five feet in height; and on the east side of the opening there stands a mass of stalagmitic breccia three feet in height, and *débris* may very probably have been piled up in this place to a still higher level than this. A fissure in the junction of the two parts of the cave which still exists may have furnished an easy route for their descent. It is of importance to note that the two portions of the cave appear to have differed in function both in earlier and later times. The bones of the pleistocene animals found in this cave were limited strictly to the northern portion of it; the same may be said of the ashes, and, with the exception constituted by a single worked flint, of the implements of man's manufacture; and in this portion of the cave, whilst a very large quantity of the bones of domesticated animals was found, only a few human bones were discovered, the number of which is not greater than what the scattering northwards and downwards which the falling in of the roof of the depression segment, subsequently eked out by occasional causes such as the interference of men or of burrowing animals, foxes, rabbits, and badgers would adequately account for. On the other hand, whilst the majority of all the human bones were discovered within or immediately adjacent to the periphery of the segment of depression, the bones of domesticated animals found within it were not more in number than might be accounted for by the hypothesis of their having been the relics of funeral feasts, a view which their being intermingled with the human remains, as they would be if accumulated at successive interments, tends to confirm.

It may, indeed, be considered a matter for surprise that any pleistocene bones or teeth were left in the cave when we consider its level and the

slopes of its floor; but the few that were left, and its possible exposure to the denuding influences of a pluvial period, it may be seen, might be preserved from being washed out by lodgment in the pockets and anfractuosities along the sinuous walls of the cave.

With reference to the period at which the owners of the human remains may be supposed to have lived, whether in the Stone, the Bronze, or the Iron age, the existence of the sunken forest at Westward Ho, on the opposite side of the Bristol Channel, forbids us to forget that it may have very well been some time later than the commencement of the neolithic period when the sea last encroached upon and overwhelmed areas in this district tenanted by stone-using men. And as such an invasion would have left the contents of this cave in a very different state from that in which we found them, even though no traces of metal of any kind were found inside any part of this cave, we must not suppose that we are justified in placing the date either of the men buried above or of the men who inhabited this cave far back in that period. But further. Two of the pieces of pottery found, either inside or in the *talus* just outside the north cave, appeared to be of the same style as one which was found in a round barrow, containing a cremation urn and burnt bones and flint chips, on the Ridgeway Hill, immediately above the Longbury Bank; and this may be supposed to suggest, though it by no means proves, that the Longbury Bank cave-inhabitants were, like the Ridgeway tumulus builders, of the Bronze age. Thirdly, in the *talus* outside the north entrance, a spindle whorl made out of the bottom of a jar of Samian ware, like two found in Dowker Bottom cave, in Yorkshire (see Professor Boyd Dawkins's 'Cave Hunting,' p. 113), was found; and half of a saucer-shaped vessel of the same material showing signs of ornamentation was found on the surface of the area of depression by Mr. Laws, lying by a piece of iron slag, the only piece of metal-work found in or near this cave. Now these specimens would bring the date of the inhabitation of the cave, if they had been found *in situ* within it, down to a period as late as that in which the inhabitants had opportunities at least of procuring articles of Roman manufacture. There is other evidence to show that the date of the burials on the roof of this cave may have been no earlier than such a date; but the finding of this piece of pottery in the externally placed *talus* does not absolutely prove the date of its being inhabited to have been so. But as regards the relative age of the human interments and of the human habitation of this cave, it is of cardinal importance to note that two thin, flattish, fine-grained red fragments of apparently Romano-British pottery were found, in company with the human bones, deep down in the "depression segment." No other articles of human manufacture, however, except one worked flint, though many remains of domestic animals, were found with them. Still, it is difficult to think that these fragments were not of the same date as the human bones found with them. On the other hand, in the north cave and on the natural bottom, known locally as "Rabb," were found the ashes and fire-place already spoken of; and in the red cave-earth, just inside the mouth of the north cave and beneath the black mould, were found a flint chip, a horn-stone scraper, and a bone needle, the juxtaposition of which is not without significance.

The finding of the remains of several dogs, one old and several young ones, so closely mixed up with the human remains at the line of communication between the north cave and the segment of depression as to

suggest that the two sets of remains had been buried and had fallen down together, and also the finding of a worked flint, and the absence of metal in that segment, are phenomena usual or universal in neolithic interments. But they have been all observed in interments even of the iron age.

On the other hand, the finding of the bones of the brown bear (*Ursus Arctos*) in the black mould of the north cave, and notably also in the east chamber, in company with, and similarly conditioned as to colour and preservation to, the bones of man and of domestic animals, appears to show with some probability that these latter remains should not take date later than at least the time, about 900 years back, when this bear ceased to infest Wales.

We have, then, in the stone and bone implements found in the north portions of this cave some tolerable evidence to the effect that it was inhabited by man in probably late neolithic times. And whilst the pottery found in the "depression segment," in company with the human bones, appears to show that they, or, at any rate, the immense majority of them, cannot be referred to an earlier than the Romano-British period, the remains of the bear give us a certain datum line of at least 900 years distance away from us as the latest period to which they can with any probability be referred.

We append a short summary of the results obtained from examination of all the bones obtained from this cave, whether obtained by Mr. Edward Laws or ourselves, after they had been washed, cleaned, and otherwise prepared.

Some 160 or so fragments of bones and teeth referable either to rhinoceros or elephant were found scattered throughout the northern segments of the cave. We have not been able to find that they were in positions apart from the other bones of more recent date, and usually of different textural condition, belonging to domestic animals, to man, and to certain *feræ naturæ* still existing either in Great Britain or in Continental Europe which will be next specified. The steep slope of the part of the cave in which they were found would render the disturbance of them, and the interminglement of them with subsequent importations an easy matter, whether the disturbing agent was the sea in a period of subsidence, or rain in a pluvial period, or, finally, man himself in his successive occupations of the cave.

No remains of hyænas were found by us amongst these palæolithic bones; but the marks of gnawing, which are conspicuous enough upon many of these bones, are so closely similar to those produced by the teeth of this carnivore elsewhere, that it is difficult to think they are not to be ascribed to it; and the more so as in other caves in this district the hyæna is very abundantly represented both by bones and by *album græcum*.

Most of the bones referable to the mammoth or rhinoceros are spongy and waterworn; some combining the traces of gnawings with those of waterwear. Some, on the other hand, have received much accession to their weight and solidity, and have also become curiously polished on their exterior by exposure to calcareous drip.

In the north cave and in its eastern diverticulum the remains of bear, roe, red deer, eagle, and black grouse were found, all being animals which, without being extinct in Europe, or being foreign in strictness of language to this part of it, would yet not be very likely to find their way into this cave in the present day. Of the bear species, *Ursus Arctos*, three individuals are represented by the bones and teeth found here.

Throughout the length and breadth of the cave, from its communication with the south cave to its northern opening, and in the talus lying outside this opening, were found bones of domesticated animals, goat, small ox, dog, pig. In the talus outside the north entrance some pelvic bones were found, which I think are sheep and not goat bones. In the same locality a nearly perfect skull of a goat was found. Some of the domesticated animal bones appear to have been but of recent date, but a great number bear marks in the way of weathering and of staining of a very considerable antiquity. They represent breeds of small size.

The horse is, though but scantily, represented in the collection from Longbury Cave; and the wild boar we have failed to recognise here.

The badger's, the fox's, and the rabbit's abound among the bones collected here. The fox's represent a small variety.

As regards the human remains, the great majority of them were found in the segment of depression or in the southward termination of the north cave immediately adjoining and continuous with it. Most of the human bones found by Mr. Laws were in the latter locality; most of those found by us were found in the former; but, either by Mr. Laws or by us, human bones or teeth were, though but in very small numbers, found in every part of the cave, not excluding even the south cave. The numbers of the several sets of fragmentary human bones may be given with some approach to accuracy as follows:—In the entire cave, exclusive of the depression segment, about 150 fragments of more or less perfect human bones were found; from the depression segment alone about 350 fragments were collected; into the talus outside the north entrance some 6 to 10 fragments of a child and of an adult had found their way; a human tooth was found in the east cave; and a piece of a skull and of a lower jaw were found in the mouth of the south cave. These numbers of course very strongly support the view that these bones fell in from a burial place corresponding to the segment of depression; and that the accident inseparable from such a tumbling down, and the subsequent scattering inseparable from the presence of the burrowings of badgers and foxes, account for the scattering of the comparatively insignificant number of bones found at any great distance from that area. It is instructive also to put on record the fact that whilst a larger number of calvarial bones was found in the depression segment, which we suppose to have underlain the place of interment of the human remains, than in all the rest of the entire cave, only three more or less fragmentary lower jaws were found in company with them; whilst by Mr. Laws five more or less nearly complete lower jaws were found in the north, and a large fragment of a sixth in the south cave. The palæontologist will find the frequency of the separation of the lower jaw from the rest of the cranium, with which he is so familiar, illustrated by this fact.

We have absolute proof in the nine lower jaws just spoken of that no less than nine human beings have their skeletons represented in the collection made from this cave. Two fragmentary representatives of lower jaws found—one in the talus outside the north entrance, the other in the middle of the north cave—correspond probably to two other skeletons, but it is just possible that they may be parts of some one or other of the nine demonstrably distinct mandibles. Of these nine individuals, no less than five were males in or beyond the middle period of life, one belonged to a woman in late life, one to a person about the age of puberty, with the wisdom tooth as yet uncut, one to a child with the first

two molars just cut, one to a child with none but the milk teeth in place.

Three more or less perfect calvaria have been reconstructed out of the remains collected by Mr. Laws and ourselves; one from the cranial bones found in the north cave, two from those found in the depression segment. All of the crania are dolichocephalic; and one, a male skull, that which came from the north cave, "mecistocephalic," in Professor Huxley's language, with a cephalic index of 69, and with the pear-shaped contour when viewed from above, due to rapid tapering from the level of the parietal tubera forwards, which has so often been spoken of since the writings of Professor Daniel Wilson as characteristic of many skulls from the earliest sepulchres of Great Britain. There is no doubt that this is a very ancient form of skull, but the well-known tenacity and persistence of such ancient forms forbids us to use it as an evidence as to date. Of the other two, one belonged undoubtedly to a man, the other to a woman; and neither, though dolichocephalic, are exaggeratedly so, as is the case with the first-named of the three.

The long bones are all more or less fragmentary; they do not present any peculiarities specially worthy of notice; the femora have not their *lineæ asperæ* greatly developed, though in one or two the upper portion of the shaft is somewhat flattened from before backwards in the origin of the insertion of the glutæus maximus; the tibiæ are not platycnemid; and neither these nor any other of the bones give the notion of their owners being much above or below the average size and height. In a word, they have not the peculiarities of prehistoric bones. The human bones present much the same appearance as to staining, wear and tear, and weathering as the bones of bear and of domesticated animals found with them. All three sets of bones alike differ from those belonging to the palæolithic period found here in being, except in a few instances, free from interstitial calcareous deposit, and from marks of gnawing except by recent rodents.

In one instance, some human bones were found imbedded in reddish-white breccia. This breccia had been formed in several places along the east wall of the north into masses about 3 feet to $3\frac{1}{2}$ feet in height, which stood out against the wall like brackets. One of these, just 15 feet from the north entrance, had embedded on its upper surface, which was about 3 feet 10 inches above the natural floor of the cave, the lower ends of two human femora, which thus came to occupy just such a position as they would be likely to do if picked up from the floor by some human inhabitant who was incommoded by their presence and placed on the top of the shelf-like bracket which was in the process of being added to by drip. With these two human bones are concreted some bones of frogs or toads, and at a depth of one foot a humerus of a roe, *Cervus capreolus*, was found similarly embedded. It is of importance to note that these brackets of breccia do not seem to be remnants of a floor which has disappeared from between the side-walls of the cave; no corresponding deposits at least are observable along the opposite wall on the west side, and, as is well known, the stalagmite-forming drip, being regulated by the conformation of the limestone, is very often anything but symmetrically arranged.

